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UNITED STATES TARIFF COMMISSION, WASHINGTON

INFORMATION CONCERNING  
THE DOMESTIC  
POTATO-PRODUCT INDUSTRIES

POTATO FLOUR  
DRIED OR DEHYDRATED POTATOES  
POTATO STARCH POTATO DEXTRINE

PRINTED FOR USE OF  
COMMITTEE ON WAYS AND MEANS  
HOUSE OF REPRESENTATIVES

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**UNITED STATES TARIFF COMMISSION.**

OFFICE, 1322 NEW YORK AVENUE, WASHINGTON, D. C.

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**LETTER OF TRANSMITTAL.**

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UNITED STATES TARIFF COMMISSION,  
*Washington, September 4, 1919.*

*Committee on Ways and Means, House of Representatives:*

I have the honor to transmit herewith, in accordance with your request, information compiled by the United States Tariff Commission on the domestic potato-product industries.

Very respectfully,

THOMAS WALKER PAGE,  
*Acting Chairman.*



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# DOMESTIC POTATO-PRODUCT INDUSTRIES.

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## SUMMARY.

### INDUSTRIAL USES OF THE POTATO.

The white or Irish potato contains 75 to 80 per cent of water, 15 to 25 per cent of starch, about 2 per cent of proteins, and 2 or 3 per cent of fiber and mineral salts, or ash. Its value as a food and in the industries is due mainly to its content of the carbohydrate, starch. Starch, either directly as such or through derivatives such as glucose, alcohol, and dextrine, is used in innumerable products and is essential to many industries. It occurs in many vegetable substances besides the potato, the most important commercially being corn, rice, wheat, cassava, sago, and arrowroot. While potato starch and its derived products are preferred for a few purposes, it is competitive with that made from other products. Whether one kind or another is bought, is largely a matter of price; and the selection of the raw material for starch manufacture is dependent upon its availability and the cost of extraction. In the United States, which produces more than twice as much corn as the rest of the world combined, corn is the principal source of starch and its products; in the industrial nations of Europe, whose climate is unfavorable for corn production, but whose physical and economic conditions give them a similar preeminence in potato production, potatoes take the place of corn as the primary raw material.

The potato serves as a raw material for the manufacture of seven products, of which five are of considerable industrial importance and two have great promise.

1. *Potato flour* consists of the whole potato except the water and peel, washed, cooked and dried, ground, and bolted to a fine flour. Potato flour is used chiefly for mixing with other bread flours and for other food products.

2. *Dried or dehydrated potatoes*, like potato flour, contains all of the content of the raw potato except water and peel, but is sold in the form of chips, flakes, or "rice" instead of as a powder or flour. The potato is first washed and peeled, and then either sliced, parboiled, and dried, or is steamed, forced through a die plate, and dried. Dried potatoes are used almost entirely for food. This product has many advantages over fresh potatoes; the heavy losses by decay or freezing are eliminated, it may be kept for a considerable period without special measures as to temperature and ventilation, and the cost of freight and handling on the large percentage of water present in fresh potatoes is avoided.

3. *Potato starch* is made from potatoes by eliminating, as completely as possible, the content of protein, fiber, and water. It is used principally in the textile industries as a sizing in weaving, in textile printing, and in the finishing of cloth. It has minor uses in laundering, paper manufacture, in food products, and in the manufacture of dextrine.

4. *Dextrine or British gum* is made from starch by the action of heat or acids. Its chief use is in the dyeing, printing, and finishing of textile fabrics. It is also used as an adhesive for gummed labels, envelopes, and stamps, and has many other uses.

5. *Glucose, dextrose, or starch sugar* is made on a large scale in Europe from potato starch, but in the United States cornstarch is used almost exclusively as the raw material of the glucose industry.

6. *Alcohol* is made in large quantities in Europe from potatoes, but in the United States molasses is the principal raw material of the industrial alcohol industry.

7. *Lactic acid* is used in tanning leather, in dyeing and calico printing, and in foods and beverages. It is made on a large scale in Germany from potatoes, but in the United States is made from vegetable ivory waste and from corn meal.

#### POTATO-PRODUCT INDUSTRIES IN THE UNITED STATES.

The industries which utilize potatoes have a useful economic function in providing an outlet for large quantities of lower grade, cull, and surplus stock that would otherwise be wasted. It has been roughly estimated that approximately 50,000,000 bushels of potatoes are wasted annually in the United States. Relative to the extensive use made of the white or Irish potato in the manufacturing and chemical industries of Europe, or to its use there as a food and feed-stuff, the consumption in the United States is small. The greater part of the United States is outside of the natural potato-growing belt, and though the adaptability of the crop permits of its production in almost every county, yields are much smaller than in Europe. Factories must be located in regions whose production is sufficiently large to yield a large supply of the lower grades, as it is unprofitable to use No. 1 potatoes for industrial purposes. Such regions are comparatively few, and are widely separated.

Potato starch has been made in the United States for many years. Although the most important of the potato products in this country, the industry has been declining, while the volume of imports increased nearly fourfold between 1904 and 1914.

#### *Production and value of potato starch.*

[From the United States Census.]

Year.	Number of factories.	Production.	Value.
		<i>Pounds.</i>	
1904. ....	131	27,509,400	\$924,476
1909. ....	110	24,873,415	823,019
1914. ....	82	23,540,472	718,006

Imports of potato starch rose from 4,438,038 pounds in 1904 to 15,518,431 pounds in 1914; they came chiefly from Germany and from Holland. Potato starch can not be produced and sold in the United States as cheaply as cornstarch, and its market is therefore limited to the comparatively few purposes for which potato starch is preferred. The output of cornstarch increased from 311,140,184

pounds, valued at \$8,878,450 in 1904, to 574,247,697 pounds, valued at \$13,784,654 in 1914. American cornstarch and glucose compete in the world markets with similar foreign products, and the exports of cornstarch greatly exceed the imports of potato starch.

The manufacture of potato flour and dried potatoes in the United States was begun during the war period and is as yet not firmly established. A large domestic demand for these products has still to be created. While cull potatoes may be used for starch production, flour and dried potatoes, being foodstuffs, require sound stock, but not necessarily the No. 1 grade which constitutes the great bulk of the table potatoes.

Dextrine is made from potato starch in this country, but large amounts are also made from cornstarch and tapioca.

#### POTATO-PRODUCT INDUSTRIES IN EUROPE.

In Europe, and especially in Germany, the conditions are quite different. Europe produces over 90 per cent of the world's annual potato harvest, and the United States only about 6 per cent. The cool and moist climate, which is not suitable for corn production, is favorable to the growing of potatoes, while its large yields to the acre and ready response to intensive cultivation adapt the crop to the limited acreages and cheaper labor of Europe. There the potato is a much more important part of the food supply. Yields to the acre more than twice as large as in the United States are usually obtained, under more intensive methods of cultivation and with a liberal use of fertilizers. Varieties considerably higher in starch content than are grown in this country have been developed for starch manufacture, and prices of potatoes are much lower. Moreover, while our quarantines, due to the danger of importing foreign plant diseases, prohibit importations of fresh potatoes from nearly all the important producing countries, indirectly they encourage shipments in the form of the prepared products.

In 1914 the German harvest of potatoes was over 1,674 million bushels, while that of the United States was about 410 millions. The use of the crop is different in the two countries. It has been estimated that in the United States 68 per cent is used for human food, 5 per cent is fed to farm animals, 11 per cent is saved for seed, 15 per cent is lost by decay and freezing, and not more than 1 per cent is used in the manufacture of starch or other potato products. In Germany, however, 28 per cent of the crop is used for food (the average per capita consumption being much larger than in the United States), 40 per cent is fed to farm animals, 12 per cent is used for seed, 10 per cent is lost by decay, 6 per cent consumed in the production of alcohol, and 4 per cent is used for making starch, glucose, and dextrine. Farm stills and factories are encouraged, and various special measures have been taken to encourage the various branches of potato manufacture. The by-products of alcohol and starch manufacture are fed to live stock. Associations or kartels of producers were formed to control the distribution and prices of the several products in the home markets and to develop foreign markets.

## IMPORT DUTIES.

The tariff act of October 3, 1913, contains the following provisions:

PAR. 581 (free list). Potatoes, and potatoes dried, desiccated, or otherwise prepared, not specially provided for in this section: *Provided*, That any of the foregoing specified articles shall be subject to a duty of 10 per centum ad valorem when imported directly or indirectly from a country, dependency, or other subdivision of government which imposes a duty on such articles imported from the United States.

PAR. 234. Starch, made from potatoes, 1 cent per pound; all other starch, including all preparations, from whatever substances produced, fit for use as starch, one-half cent per pound.

PAR. 36. Gums: \* \* \* dextrine, made from potato starch or potato flour, 1½ cents per pound.

With regard to fresh potatoes, it is noteworthy that shipments from the countries of largest production are prohibited, under regulations promulgated by the Federal Horticultural Board in accordance with the plant quarantine act of August 20, 1912, designed to prevent the entry of injurious plant diseases and insect pests. Only Canada, the Bermudas, Holland, Belgium, and certain regions of relatively insignificant production are permitted to export to the United States (the Territories of Porto Rico and Hawaii are exempt from this restriction). The reciprocal provision of paragraph 581, permitting entry free of duty, applies to Canada, the Bermudas, Holland, and Belgium.

Of the countries from which effective competition in potato flour and dried or prepared potatoes appears possible, the following may ship these products to the United States free of duty under the reciprocal provision of paragraph 581 of the 1913 tariff: Canada, Belgium, Denmark, Holland, and the United Kingdom.

Potato starch was formerly incorrectly designated in the trade as "potato flour." Under Treasury Decision No. 16955 of February 4, 1896, so-called "potato flour" consisting really of potato starch was held dutiable under paragraph 232 of the tariff act of 1894 as "starch" rather than as a nonenumerated article. (See Appendix, p. 25, for reprint of this decision.) On August 18, 1915, the Bureau of Chemistry of the Department of Agriculture, under the authority of the pure food and drugs act of June 30, 1906, ruled that the term "potato flour" can not be applied to a product containing starch alone, but only to a finely divided or powdered product containing fat, fiber, and ash constituents from the edible portion of the potato. (See Appendix, p. 25, for reprint of this decision.)

On March 5, 1914, the Treasury Department ruled that "potato flour" should be classified as a nonenumerated manufactured article under paragraph 385 of the act of 1913 rather than as "potatoes, dried, desiccated, or otherwise prepared" under paragraph 581 (T. D. 34236). This decision was sustained by the Board of General Appraisers (Abstract 37090, T. D. 35020), but was overruled on March 3, 1915, by the Court of Customs Appeals (*Stein v. United States*, 6 Ct. Cust. Appls., 154), which held that the "potato ground meal" or "potato flour" consisting of the entire potato, including the skin or of the edible contents of the potato, should be classified under paragraph 581 of the act of October 3, 1913, as "potatoes, dried, desiccated, or otherwise prepared," rather than as a non-enumerated article. (See Appendix, p. 26, for a reprint of this decision.)

### TARIFF CONSIDERATIONS.

The commission has no tariff policy and makes no recommendation of rates, but if Congress determines to impose duties it should be borne in mind—

(1) That as potato starch is the raw material used in the manufacture of dextrine, a duty, if any, upon dextrine ought logically to be adjusted to that of starch. The differential allowed in the 1913 tariff was one-fourth cent per pound. While about 20 per cent is lost in the process of dextrine manufacture, manufacturers regain part of this loss by allowing the product to absorb moisture.

(2) That intermediate products, such as potato flakes and pressed potato cake, may be imported free of duty under paragraph 581; such products may be produced more cheaply in Europe. If a duty is placed on potato flour or starch, provision logically should be made for "potatoes, dried or otherwise prepared," in order to prevent evasion through the importation of semi-manufactured products.

(3) If it be the legislative policy to protect by means of import duties the several branches of manufacture which provide an outlet for surplus or lower grade potatoes, provision should also be made for dried or dehydrated potatoes.

(4) The use of the term "natural" as applied to potato flour, current in Germany probably to distinguish it from potato starch, a similar product, should be avoided, as it is apt to give rise to various interpretations, is unnecessary because of decisions under the Pure Food and Drugs act, and may cause confusion.

### POTATO FLOUR.

#### USES.

During the shortage of wheat incident to the world war, potato flour was extensively used, especially in Europe, for mixing with other bread flours. Bread with as much as 50 per cent of this flour can be made. This has been the principal outlet; it may also be used in making soups, cakes, and many similar preparations. It is claimed that an admixture of 5 per cent of potato to wheat flour improves the flavor of bread and enables it to retain its freshness for a longer period. Moreover, by reason of its characteristic quality of absorbing moisture, bakers may obtain a larger number of loaves from a given unit of flour than by using wheat flour exclusively. For this reason potato flour may be used by bakers even when higher in price than wheat flour. However, a large domestic demand has yet to be created.

#### PROCESSES.

The machine process most generally employed was developed in Germany. Sound stock below the Federal grade of No. 1 is used. Potatoes are washed, cooked, dried on a roll or "flake" drier, and the "flakes," scraped from the drier, are ground and bolted. The products of this flaking process may take the form of flakes, which may be kept for a considerable period without spoiling, of a coarse meal, and of a finely-ground flour. It requires about 5 pounds of potatoes to produce 1 pound of this flour, a bushel yielding 12 pounds.

## DOMESTIC PRODUCTION.

In 1918 five potato flour factories were operating, their combined production being 2,500,000 pounds. Three of these factories are controlled by a large corporation, which is surveying the field with a view to erecting others in regions of large production. The first domestic plant was established in Idaho in 1917; four others are operating in Nebraska, Michigan, Wisconsin, and Minnesota.

## PRICES.

Prices for potato flour are approximately the same as for starch (see p. 18). The prewar price was between 3 and 4 cents per pound. In 1914 the average declared value of imports was 3.2 cents per pound.

## TARIFF HISTORY AND CUSTOMS DECISIONS.

Neither the existing tariff nor those previously enacted made separate provision for potato flour. Under a decision of the Court of Customs Appeals (*Stein v. U. S.*, 6 Ct. Cust. Appls., 154) potato ground meal or flour, invoiced as "kartoffelwalzmehl," obtained by reducing the entire potato with or without the skin to a state of flour by desiccating and grinding, the process involving the application of sufficient heat materially to modify the starch granules, was declared to contain the entire and chemically unaltered elements of which potatoes are composed and not having acquired a new name, character, or use and serving the culinary purposes of potatoes, was held to be exempt from duty under paragraph 581 of the tariff act of October 3, 1913, unless "imported directly or indirectly from a country, dependency, or other subdivision of government which imposes a duty on such articles imported from the United States," in which case a duty of 10 per cent ad valorem applies. This flour was found to be chiefly used for breadmaking, a minor use being the making of soups and other food products.

## IMPORTS.

While potato flour has not been separately enumerated in the commerce and navigation statistics of the United States, the imports of "potatoes, dried, desiccated, or otherwise prepared," apparently consist chiefly of this flour. The maximum imports occurred in 1914, when they amounted to 560,987 pounds, valued at \$17,937. In 1918 there were imported 449,034 pounds, valued at \$115,718.

*Imports for consumption.*

## POTATOES, DRIED, DESICCATED, OR OTHERWISE PREPARED.

Fiscal year.	Rates of duty.	Quantities.	Values.	Duties collected.	Value per unit of quantity.	Actual and computed ad valorem rate.
		<i>Pounds.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Dollars.</i>	<i>Per cent.</i>
1914 (beginning Oct. 3, 1913).	Free.	38,121	1,422		0.037	
	10 per cent ad valorem.	522,893	16,515	1,651.50	.032	10
1915.....	Free.	13,863	908		.064	
	10 per cent ad valorem.	97,751	2,338	233.80	.023	10
1916.....	Free.	14,181	1,101		.077	
	10 per cent ad valorem.	5,525	321	32.10	.058	10
1917.....	Free.	3,417	749		.216	
	10 per cent ad valorem.	10,020	1,896	189.60	.18	10
1918.....	Free.	6,445	2,220		.344	
	10 per cent ad valorem.	412,589	113,912	11,391.20	.268	10

<sup>1</sup> Not separately stated prior to Oct. 3, 1913.

## DRIED OR DEHYDRATED POTATOES.

## USES AND PROCESSES.

During the American participation in the World War large quantities of potatoes were dried for Army use. The product took the form of potato chips or dried, sliced and "riced" potatoes; it could readily be prepared for use under field or camp conditions. Among its advantages over the raw potato are the elimination of waste through decay and freezing, ease of transportation, storage and preparation, and avoidance of much of the loss incident to the usual method of peeling.

The manufacturing process is more expensive than that involved in making potato flour. The Army specifications required the use of No. 1 potatoes, but small or slightly damaged stock is ordinarily used. The fresh potatoes are first run through a washing and peeling machine, and then carried on a "sorting belt" where workers eliminate unsuitable stock. Next it is either sliced, parboiled, and dried in a current of warm air, or put through a "ricing process," i. e., is steamed, forced through a die plate in the method of macaroni manufacture, and thoroughly dried. When dried until thoroughly brittle these products will keep indefinitely. They may be used for stews, soups, and similar preparations, and may also be ground and bolted into flour. Potato flour and dried potatoes contain all the constituents of the fresh product, the peel only being removed—in the flour by bolting and in the dried product by the peeling machine. In starch manufacture the proteins and mineral constituents are removed as completely as possible.

## DOMESTIC PRODUCTION.

Sixteen plants were producing dehydrated potatoes in 1918, their combined output being about 7,000,000 pounds. With the cessation of hostilities and a great reduction in the demands of the military establishments, the industry is placed on an uncertain footing. To a greater degree than in the case of potato flour, the future of the drying industry is dependent upon the development of a demand for the dried product, as a substitute for fresh potatoes, in households, hotels, and restaurants.

*The German potato-drying industry.<sup>1</sup>*

	1908-09	1909-10	1910-11
Total number of factories.....	170	254	327
Factories using as raw material:			
Peeled potatoes.....	6	8	4
Unpeeled potatoes.....	164	246	323
Quantity of domestic and foreign potatoes used.....bushels..	5,898,774	12,222,302	15,345,485
Products:			
Cut and sliced potatoes.....pounds..	14,263,762	35,163,370	31,878,516
Flakes and meal.....do.....	77,072,816	157,143,888	204,057,776
All others.....do.....	330,690	793,656	661,380
Total.....do.....	91,667,268	193,100,914	236,597,672

Source: Statistisches Jahrbuch für das Deutsche Reich, Berlin, 1911.

### TARIFF HISTORY.

"Potatoes dried, desiccated, or otherwise prepared," were first specifically provided for in the tariff act of October 3, 1913, paragraph 581. They are free of duty when from countries which accord like treatment to the American product; when from other countries the duty is 10 per cent ad valorem, which was equivalent to about three-tenths of a cent per pound in 1914.

### POTATO STARCH.

#### DESCRIPTION.

Potato starch is a white or gray, odorless and tasteless powder. Chemically it is identical with starch from other sources but the physical properties of potato starch, which differ slightly from those of other starches, better adapt it to certain industrial uses, especially in the textile industry.

#### USES.

The uses of starch may be divided into three classes: (1) For edible purposes, especially in puddings, confectionery, pastry, and for stiffening ice cream, custard, and pie fillings. Starch is also the largest component of most cereals and flours. (2) For laundry purposes. (3) For manufacturing purposes, including weaving, dyeing, printing, and finishing textiles, the manufacture of dextrine, soluble starch, glucose, alcohol, and lactic acid and the explosive, nitrostarch.

Potato starch competes with other kinds of starch for these uses and being more expensive than cornstarch is used in relatively small amounts in the United States. In the textile industry and in the manufacture of dextrine, potato starch has certain advantages which give it a market even at a higher price. Cornstarch manufacturers have, however, found means to make varieties suitable for use in the textile industry and are offering increasingly severe competition to potato starch.

#### METHOD OF MANUFACTURE.

The manufacture of starch from potatoes consists simply in the mechanical separation of the starch from the other parts of the tubers by a process of disintegrating the cells and washing out the starch with water. The quantity of starch contained in the raw material varies with the variety of the potatoes. In Germany, special varieties of potatoes with a starch content of 20 to 25 per cent have been developed for the starch industry. In the United States, culls and lower grades, containing from 14 to 17 per cent of starch, are usually employed.

#### DOMESTIC PRODUCTION.

The manufacture of starch is the most important of the industrial uses to which the potato is put in the United States. However, the industry is declining owing to the severe competition of cornstarch and of imported potato starch. The consumption of potatoes by the starch factories decreased from 210,608,127 pounds in 1909 to 169,-



878,784 pounds in 1914 and the output of potato starch from 24,873,415 pounds in 1909 to 23,540,472 pounds in 1914. The number of establishments reporting the manufacture of starch has decreased from 131 in 1904 to 110 in 1909 and to 82 in 1914. Of the 89 factories engaged in the manufacture of both glucose and starch in 1914, 51 were located in the State of Maine, 7 in Minnesota, 5 in Illinois, 4 in Massachusetts, and the remainder were distributed among 14 other States. Arrostook County, Me., is the principal center of the potato starch industry in the United States.

*Production of potato starch and cornstarch in the United States.<sup>1</sup>*

Year.	Number of factories.	Potato starch.		Cornstarch.	
		Pounds.	Value.	Pounds.	Value.
1904.....	131	27,709,400	\$924,476	311,140,814	\$8,878,450
1909.....	110	24,873,415	823,019	638,825,366	15,962,916
1914.....	82	23,540,472	718,006	574,247,097	13,784,654
1915.....				775,891,619	
1916.....				898,916,578	
1917.....				833,131,755	
1918 (first six months).....				481,761,893	

<sup>1</sup> Figures for 1904, 1909, and 1914 are from the Census of Manufactures; those for 1915-1918 were compiled by the cornstarch producers and taken from the Textile American, December, 1918.

PRODUCTION IN FOREIGN COUNTRIES.

In Germany about 4 per cent of the total crop of potatoes is used for the manufacture of starch. The production of potato starch and related products in Germany for the fiscal year 1910-11 is shown in the following table:

*German production of potato products, 1910-11.*

	Quantity.	Value.
Potato starch:	<i>Pounds.</i>	
Wet starch.....	125,671,700	\$1,424,192
Dry starch and potato meal.....	383,019,708	8,447,810
Dry and wet washing starch.....	7,948,905	61,880
Potato sago.....	5,277,592	168,206
Potato meal (lump).....	826,725	28,560
Glucose.....	21,940,400	559,018
Glucose sirup.....	121,332,385	3,104,472
Caramel.....	9,673,123	307,734
Dextrine.....	49,310,288	1,404,914
Soluble starch.....	3,602,076	107,100
Dried pulp (residue).....	27,894,636	144,942
Wet and steamed pulp.....	513,556,940	212,295
Total.....	1,272,964,498	15,962,184

Source: Vierteljahrshefte zur Statistik des Deutschen Reichs, III (p.) 114, Berlin, 1914.

As a result of the total elimination of Germany from the world's markets and the great reduction of the exports from the Netherlands, Japan produced and exported large quantities of starch during the war. Prior to 1917 the exports of starch from Japan were not shown separately but were grouped with the less important grains, meals, and groats. In 1917 the total exports of starch alone were given as 133,467,552 pounds valued at \$7,483,278. Of this amount, 68.65 per cent was shipped to Great Britain, 12.51 per cent to the United States, and the remainder to France, Egypt, and British India.

## IMPORTS.

Approximately 95 per cent of the starch imported into the United States is potato starch. From 1904–1908 imports averaged 6,121,589 pounds valued at \$163,655, from 1909–1913, 13,730,665 pounds valued at \$375,767, and from 1914–1918 they averaged 15,143,778 pounds valued at \$704,712. Before the war, Germany and the Netherlands supplied practically all of the imports but during the last two years great quantities have been received from Japan. Imports from that country which amounted to only 677,422 pounds in 1916 rose to 18,008,666 pounds in 1917 and to 21,806,975 pounds in 1918. Of the total imports of starch in 1918, 58 per cent entered at the New York customs district and 33 per cent at the Pacific coast districts.

*Imports of starch, by countries.*

[Fiscal years.]

Imported from—	1910		1911		1912	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Germany.....	8,993,273	\$234,052	6,665,060	\$171,228	7,268,433	\$216,426
Netherlands.....	1,304,993	30,544	459,693	10,788	6,823,852	194,386
England.....	177,507	14,753	335,023	21,952	770,505	33,444
Canada.....			172	14	129	8
Japan.....	39,253	1,708	36,145	1,463	39,065	1,588
All other.....	346,284	14,963	442,637	17,025	938,853	32,613
Total.....	10,861,310	296,030	7,938,730	222,470	15,841,437	478,465

Imported from—	1913		1914		1915	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Germany.....	6,312,661	\$178,296	9,252,707	\$227,723	1,583,796	\$36,968
Netherlands.....	9,180,720	228,618	5,265,399	126,283	10,250,131	239,031
England.....	299,628	21,880	354,322	23,425	916,678	46,119
Canada.....	76	5	1,036	39	787	34
Japan.....	49,523	2,132	51,804	2,412	61,745	2,643
All other.....	567,890	26,853	563,166	29,040	410,246	18,927
Total.....	16,710,498	457,784	15,518,431	408,922	13,233,383	343,805

Imported from—	1916		1917		1918	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Germany.....						
Netherlands.....	212,393	\$11,528	6,800	\$537		
England.....	913,218	61,234	827,364	59,567		
Canada.....	621	52	852,893	61,019	1,213,310	\$109,673
Japan.....	677,422	23,613	18,008,666	799,775	21,806,975	1,494,131
All other.....	663,381	27,381	952,170	52,602	831,830	69,673
Total.....	2,467,038	123,838	20,647,893	973,530	23,852,145	1,673,477

*Imports for consumption.*

## POTATO STARCH.

Fiscal year.	Rates of duty (per pound).	Quantities.	Value.	Duty collected.	Actual and computed ad valorem rate.
	<i>Cents.</i>	<i>Pounds.</i>			<i>Per cent.</i>
1908.....	1½	4,544,520	\$113,807	\$68,128	59.90
1909.....	1½	15,418,259	351,256	231,274	65.84
1910.....	1½	9,812,905	255,040	147,194	57.71
1911.....	1½	7,724,912	202,482	115,874	57.23
1912.....	1½	14,010,532	405,135	210,158	51.87
1913.....	1½	14,176,119	375,514	212,642	56.63
1914 <sup>1</sup> .....	1½	1,922,422	49,200	28,836	58.61
1914 <sup>2</sup> .....	1	12,010,549	284,384	120,105	42.23
1915.....	1	10,940,419	253,823	109,404	43.10
1916.....	1	2,337,717	72,736	23,377	32.14
1917.....	1	17,545,689	797,327	175,457	22.01
1918.....	1	13,195,079	902,499	131,951	14.62

## ALL OTHER STARCHES.

1908.....	1½	932,234	\$31,227	\$13,983	44.78
1909.....	1½	1,479,425	43,729	22,191	50.75
1910.....	1½	61,973	1,821	974	53.52
1911.....	1	740,564	33,843	7,405	21.88
1912.....	1	615,456	31,805	6,155	19.38
1913.....	1	631,435	35,462	6,314	17.81
1914.....	1	677,785	40,645	6,778	16.68
1914 <sup>1</sup> .....	1	189,557	10,219	1,896	18.55
1914 <sup>2</sup> .....	1	771,517	41,893	3,858	9.21
1915.....	1	952,934	52,537	4,764	9.07
1916.....	1	1,242,295	78,807	6,211	7.88
1917.....	1	888,345	62,132	4,441	7.15
1918.....	1	557,100	63,604	2,785	4.38

<sup>1</sup> July 1 to Oct. 3, 1913.<sup>2</sup> Oct. 4, 1913, to June 30, 1914.

## EXPORTS.

Exports of starch from the United States from 1914-1918 have averaged 102,848,429 pounds annually, valued at \$3,913,104. Practically all of this is cornstarch. Prior to 1918 all exports of starch were grouped under one head in the export statistics but in this year 38,659,323 pounds of "cornstarch (except for table use)" were shown. Over half of the exports go to England. Before the war the Netherlands and Belgium also took large quantities.

*Exports of starch, by countries.*

[Fiscal years.]

Exported to	1914		1915		1916	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Austria.....	1,011,900	\$25,545				
Belgium.....	3,751,577	82,809	658,353	\$14,380		
Netherlands.....	3,571,199	85,334	13,070,665	392,496	16,639,188	\$439,159
England.....	53,020,773	1,200,560	56,729,921	1,426,942	119,696,706	3,107,677
Canada.....	1,941,408	63,625	1,379,346	50,959	2,235,901	70,928
Cuba.....	125,576	3,683	225,484	6,585	111,844	12,385
Japan.....	1,734,169	77,988	631,417	26,867	849,849	27,020
France.....	14,328	347	2,063,856	61,809	3,822,921	119,825
All other.....	11,542,858	285,669	32,177,596	959,435	66,528,783	1,799,920
Total.....	76,713,779	1,825,230	107,036,638	2,939,453	210,185,192	5,576,914

*Exports of starch, by countries—Continued.*

Exported to—	1917		1918 <sup>1</sup>		1918 <sup>2</sup>	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Austria.....						
Belgium.....						
Netherlands.....	1,762,200	\$49,533				
England.....	96,498,389	3,075,309	16,103,199	\$1,023,009	21,197,974	\$1,177,122
Canada.....	2,943,034	122,551	1,066,258	68,613	2,032,440	122,376
Cuba.....	2,383,028	73,652	1,291,265	90,780	3,635,212	222,161
Japan.....	443,596	15,786	129,488	8,656	1,298	120
France.....	7,304,465	246,848	2,357,480	134,053	2,305,346	127,919
All other.....	35,089,110	1,137,844	14,882,700	956,904	9,487,053	570,679
Total.....	146,423,822	4,721,533	35,223,390	2,282,015	38,659,323	2,220,377

<sup>1</sup> Starch, all other.<sup>2</sup> Cornstarch (except for table use.)

## PRICES.

Market prices are quoted for cornstarch, domestic and Japanese potato starch, rice starch, and wheat starch. Cornstarch, which has always been quoted at the lowest price, rose from about 2 cents per pound in August, 1914, to about 6 cents in July, 1919. The price of potato starch has increased from about 5 cents per pound in August, 1914, to about 10 cents in July, 1919, and during most of this period it has been quoted at slightly over 12 cents. The domestic and imported potato starches bring about the same price, although recently the imported product has been quoted at a fraction of a cent more per pound. Rice and wheat starch are relatively unimportant and quotations have not always been shown. Wheat starch sold for slightly less than potato starch in August, 1914, but in July, 1919, it was quoted at 9½ to 10 cents per pound.

*Wholesale prices of starch at New York.*

[Cents per pound, spot.]

Date.	Corn-starch.	Potato starch.	Rice starch.	Wheat starch.
January, 1910.....	2.12 to 2.28	5 to 5½	6½ to 7	5 to 5½
April, 1910.....	1.97 to 2.13	4½ to 5	7 to 8	5½ to 5½
July, 1910.....	1.72 to 1.88	3½ to 5	7 to 8	5½ to 5½
October, 1910.....	1.60 to 1.76	4 to 5½	7 to 8	4½ to 5½
January, 1911.....	1.52 to 1.68	4 to 5½	7 to 8	4½ to 5½
April, 1911.....	1.37 to 1.53	4 to 5½	7 to 8	4½ to 5½
July, 1911.....	1.70 to 1.86	4½ to 4½	7 to 8	4½ to 5½
October, 1911.....	2.10 to 2.26	4 to 4½	7 to 8	4½ to 5½
January, 1912.....	1.82 to 1.98	5½ to 5½	7 to 8	4½ to 5½
April, 1912.....	2.07 to 2.21	5 to 5½	7 to 8	4½ to 5½
July, 1912.....	2.55 to 2.76	5½ to 5½	7 to 8	4½ to 5½
October, 1912.....	2.25 to 2.36	5½ to 5½	7 to 8	4½ to 5½
January, 1913.....	2.00 to 2.11	5 to 5½	7 to 8	4½ to 5½
April, 1913.....	1.65 to 1.76	5 to 5½	7 to 8	4½ to 5½
July, 1913.....	1.92 to 2.03	5½ to 5½	7 to 8	4½ to 5½
October, 1913.....	2.34 to 2.45	5½ to 5½	7 to 8	4½ to 5½
January, 1914.....	2.34 to 2.46	5½ to 5½	7 to 8	4½ to 5½
April, 1914.....	1.84 to 1.95	5 to 5½	7 to 8	4½ to 5½
July, 1914.....	1.99 to 2.10	5½ to 5½	7 to 8	4½ to 5½
October, 1914.....	2.29 to 2.40	5½ to 5½	7 to 8	4½ to 5½
January, 1915.....	1.99 to 2.10	5½ to 5½	7 to 8	4½ to 5½
April, 1915.....	2.15 to 2.26	5 to 5½	7 to 8	4½ to 5½
July, 1915.....	2.35 to 2.46	5½ to 5½	7 to 8	4½ to 5½
October, 1915.....	2.15 to 2.26	5 to 5½	7 to 8	4½ to 5½
January, 1916.....	2.05 to 2.16	5½ to 5½	7 to 8	4½ to 5½
April, 1916.....	2.25 to 2.36	6 to 6½		

*Wholesale prices of starch at New York—Continued.*

Date.	Corn-starch.	Potato starch.	Rice starch.	Wheat starch.
July, 1916.....	2.25 to 2.31	6 to 6½	.....	.....
October, 1916.....	2.65 to 2.71	6 to 8½	.....	.....
January, 1917.....	2.85 to 2.91	6 to 8½	.....	.....
April, 1917.....	3.65 to 5.11	12½ to 13	.....	.....
July, 1917.....	5.05 to 5.18	12½ to 13	.....	.....
October, 1917.....	6.30 to 6.48	12½ to 13	.....	.....
January, 1918.....	6.30 to 6.48	12½ to 13	.....	.....
April, 1918.....	6.30 to 6.48	12 to 15½	.....	.....
July, 1918.....	5.50 to 7.00	12½ to 13	.....	.....
October, 1918.....	6.00 to 7.00	12½ to 13	.....	.....
January, 1919.....	4.15 to 5.00	11½ to 12½	.....	.....
April, 1919.....	4.52 to .....	7½ to 8	.....	.....
July, 1919.....	5.77 to 5.99	9 to 9½	19 to ..	9½ to 10

## TARIFF HISTORY.

All starches and preparations fit for use as starch were dutiable at 2 cents per pound under the act of 1890. The rate was reduced to 1½ cents in 1894. Starch made from potatoes was specifically provided for in the act of 1883 at 2 cents per pound and in the act of 1909 at the rate of 1½ cents. In the act of 1913 the rate for potato starch was reduced to 1 cent and that for all other starches and preparations fit for use as starch was reduced to one-half cent per pound.

*Rates of duty on starch.*

Act of—	Paragraph.	Tariff classification or description.	Rates of duty, specific and ad valorem.
1883	269	Potato * * * starch.....	2 cents per pound.
1890	323	Starch, including all preparations, from whatever substance produced, fit for use as starch.	2 cents per pound.
1894	232	Starch, including all preparations, from whatever substance produced, commonly used as starch.	1½ cents per pound.
1897	285	Same as 1890.....	Do.
1909	296	Starch made from potatoes.....	1½ cents per pound.
	296	All other starch, including all preparations, from whatever substance produced, fit for use as starch.	1 cent per pound.
1913	234	Starch made from potatoes.....	Do.
	234	All other starch, including all preparations, from whatever substance produced, fit for use as starch.	½ cent per pound.

## DEXTRINE.

## DESCRIPTION.

Dextrine is a gummy substance produced from starch by heating either alone or with a dilute acid. It is sometimes considered to be an intermediate product between starch and glucose. It is soluble in water and has strong adhesive properties. Dextrine appears on the market as potato dextrine, corn dextrine, tapioca dextrine, British gum, and burnt starch. "British gum" and "burnt starch" are commercial terms usually applied to the cruder product.

## USES.

Dextrine is used in over 70 different industries, but most extensively in the dyeing, printing, and finishing of textile fabrics. Large quantities are used for thickening mordants in dyeing and printing and as sizing for cotton goods and paper. Another and very important use is in the preparation of gummed labels, envelopes, and postage stamps. Dextrines are employed as substitutes for such natural gums as gum arabic and tragacanth in preparing felt, in the manufacture of ink, and in many other uses.

## MANUFACTURE.

Dextrine is made by heating starch in an iron cylinder either by a free flame or in an oil bath or steam jacket. It is also made by moistening starch with dilute acid, drying in the air or by heating to a low temperature, and finally placing the finely ground product in a suitable oven, heated with superheated steam. The powder is continuously stirred to secure intimate mixture. When dextrine is made with acid it is usually lighter in color but contains some sugar, and therefore does not have as strong adhesive properties as when made by heat alone. In the conversion of starch to dextrine there is a loss of approximately 20 to 25 per cent; however, a part of this is compensated by water absorbed by the dextrine.

The properties of the dextrine produced will depend upon the source of the starch used. Potato starch produces the finest product with the greatest adhesive power and is generally preferred in textile trades. Tapioca or cassava starch produces dextrine very suitable for gumming envelopes and postage stamps, and the United States Bureau of Engraving and Printing formerly consumed about 250 tons of tapioca dextrine each year. During the war, when imports of tapioca were restricted, the change was made to a mixture of corn and tapioca dextrine, and it is believed that the product has proved satisfactory.

## DOMESTIC PRODUCTION.

The largest plants for the production of dextrine are now located in the United States. Before the war little or no potato dextrine was manufactured and the production was restricted almost entirely to corn dextrine. Tapioca dextrine, which was formerly imported from England, is now made in greater quantities here than abroad. The starch from which it is manufactured is imported from Java. The Census of Manufactures gives the following statistics for the domestic production of dextrines:

*Domestic production of dextrine.*

	1904	1909	1914
Dextrines: <sup>1</sup>			
Pounds.....	6,651,731	16,148,931	18,913,641
Value.....	\$231,708	\$610,999	\$705,584

<sup>1</sup> Statistics for 1904 and 1909 include "Gums, other than rosin."

## FOREIGN PRODUCTION.

Before the war potato dextrine was made almost entirely in Germany and Holland and tapioca dextrine largely in England. The German production of potato dextrine for the fiscal year 1910-11 amounted to 49,310,288 pounds valued at \$1,404,914. In Japan the production of potato starch increased enormously during the war period but up to the present time she has exported starch rather than dextrine to the United States.

## IMPORTS AND EXPORTS.

Before the war the United States imported large quantities of refined potato dextrine from Germany and Holland and considerable quantities from England. The annual imports averaged over 5,000,000 pounds from 1910 to 1914 but dwindled to less than 100,000 pounds in 1918.

Exports of dextrine have never been shown in Commerce and Navigation of the United States, but it is believed that they are insignificant.

*Imports for consumption.*

DEXTRINE, DEXTRINE SUBSTITUTES, SOLUBLE STARCH, CHEMICALLY TREATED STARCH, BURNT STARCH, GUM SUBSTITUTES, OR BRITISH GUM.

Fiscal years.	Rates of duty (per pound).	Quantities (pounds).	Values (dollars).	Duties collected (dollars).	Value per unit of quantity.	Actual and computed ad valorem rate.
	<i>Cents.</i>					<i>Per cent.</i>
1908.....	2	3,958,925	122,870	79,179.00	\$0.031	64.44
1909.....	2	6,062,353	184,476	121,247.00	.030	65.73
1910.....	2	455,546	13,585	9,110.92	.030	67.00
1910.....	1½	5,936,215	183,508	89,043.29	.031	48.52
1911.....	1½	6,357,790	190,660	95,366.79	.030	50.02
1912.....	1½	5,352,277	188,332	80,284.24	.035	42.63
1913.....	1½	5,096,891	180,296	76,453.40	.035	42.40
1914.....	1½	986,644	32,433	14,799.70	.033	45.03

## DEXTRINE MADE FROM POTATO STARCH OR POTATO FLOUR.

Fiscal years.	Rates of duty (per pound).	Quantities (pounds).	Values (dollars).	Duties collected (dollars).	Value per unit of quantity.	Actual and computed ad valorem rate.
	<i>Cents.</i>					<i>Per cent.</i>
1914.....	1½	5,226,421	162,688	65,330.27	\$0.031	40.16
1915.....	1½	4,590,437	154,087	57,380.00	.034	37.20
1916.....	1½	720,106	40,552	9,001.00	.056	22.20
1917.....	1½	210,948	17,832	2,636.00	.084	14.79
1918.....	1½	99,228	9,116	1,210.00	.092	13.61

## DEXTRINE N. S. P. F., DEXTRINE SUBSTITUTES, BURNT STARCH, OR BRITISH GUM.

Fiscal years.	Rates of duty (per pound).	Quantities (pounds).	Values (dollars).	Duties collected (dollars).	Value per unit of quantity.	Actual and computed ad valorem rate.
	<i>Cents.</i>					<i>Per cent.</i>
1914.....	3	471,191	18,180	3,536.18	\$0.039	19.45
1915.....	3	274,668	12,028	2,060.00	.044	17.13
1916.....	3	151,882	10,049	1,161.00	.066	11.56
1917.....	3	32,773	2,855	245.00	.087	8.61
1918.....	4	505	50	3.00	.099	7.58

## PRICES.

Potato dextrine is usually the highest priced of the dextrines, and corn dextrine the cheapest. In August, 1914, imported potato dextrine sold at 6 to 7 cents per pound, domestic potato dextrine at 5½ to 7 cents, British gum at 3½ to 3¼ cents, and corn dextrine at 3 to 3½ cents per pound. Since that time the prices have risen, until in the latter part of 1918 domestic potato dextrine was quoted at 20 cents. Corn dextrine during this period sold for 8 to 8½ cents.

*Wholesale prices of dextrine at New York.*

[Cents per pound, spot.]

Date.	Imported potato dextrine.	Domestic potato dextrine.	Corn dextrine.	British gum.
January, 1910.....	6 to 7	5 to 6½	2.79 to 2.95	3.14 to 3.30
April, 1910.....	6 to 7	5½ to 6½	2.72 to 2.88	2.97 to 3.13
July, 1910.....	6 to 7	5½ to 6½	2.47 to 2.63	2.72 to 2.88
October, 1910.....	5½ to 7	5½ to 6½	2.37 to 2.53	2.62 to 2.78
January, 1911.....	5½ to 7	5½ to 6½	2.32 to 2.48	2.52 to 2.68
April, 1911.....	5½ to 7	5½ to 7	2.12 to 2.28	2.37 to 2.53
July, 1911.....	5½ to 7	5 to 6½	2.47 to 2.88	2.72 to 2.88
October, 1911.....	6½ to 7½	5½ to 7	2.87 to 3.03	3.07 to 3.23
January, 1912.....	6 to 7	5½ to 7	.....	2.82 to 2.96
April, 1912.....	6 to 7	5½ to 7	.....	3.07 to 3.21
July, 1912.....	6 to 7	5½ to 7	.....	3.55 to 3.66
October, 1912.....	6 to 7	5½ to 7	.....	3.25 to 3.36
January, 1913.....	6 to 7	5½ to 7	.....	3.00 to 3.11
April, 1913.....	6 to 7	5½ to 7	.....	2.67 to 2.76
July, 1913.....	6 to 7	5½ to 7	.....	2.95 to 3.06
October, 1913.....	6 to 7	5½ to 7	.....	3.27 to 3.38
January, 1914.....	6 to 7	5½ to 7	.....	3.17 to 3.28
April, 1914.....	6 to 7	5½ to 7	.....	2.73 to 2.78
July, 1914.....	6 to 7	5½ to 7	.....	3.02 to 3.13
October, 1914.....	10 to 12	8 to 10	.....	3.32 to 3.43
January, 1915.....	10 to 12	8 to 10	4 to 5	3.00 to 3.125
April, 1915.....	10 to 12	8 to 10	.....	3.125 to 3.25
July, 1915.....	10 to 12	8 to 10	.....	3.333 to 3.50
October, 1915.....	10 to 12	8 to 10	.....	3.125 to 3.25
January, 1916.....	10 to 12	8 to 10	5 to 7	3.00 to 3.125
April, 1916.....	12 to 13	8 to 10	.....	3.25 to 3.333
July, 1916.....	12 to 13	8 to 10	.....	3.20 to 3.25
October, 1916.....	12 to 13	8 to 10	.....	3.65 to 3.71
January, 1917.....	12 to 13	8 to 10	6 to 7	3.85 to 3.91
April, 1917.....	12 to 13	12½ to 16	.....	5.20 to .....
July, 1917.....	12 to 13	12½ to .....	.....	6.30 to 6.39
October, 1917.....	12 to 13	12 to 12½	.....	7.55 to 7.64
January, 1918.....	18 to ...	14½ to ...	7 to 8	(1)
April, 1918.....	19 to ...	16 to 16½	7½ to 8½	(1)
July, 1918.....	(1)	19½ to 20½	8 to 9	(1)
October, 1918.....	(1)	20 to 20½	8 to 8½	(1)
January, 1919.....	(1)	17½ to 19	6 to 7½	6.00 to 7.00
April, 1919.....	15 to 17	15 to 17	5½ to 6	5.50 to 6.00
July, 1919.....	17 to 18	17 to 18	7 to 7½	7.25 to 7.50

<sup>1</sup> Nominal.

## TARIFF HISTORY.

Dextrine and British gum were first specifically mentioned in the tariff act of 1883 and were given a duty of 1 cent per pound. This rate was increased to 1½ cents in 1890 and to 2 cents in 1897, but restored to 1½ cents in 1909. In the act of 1913 dextrine made from potato starch was dutiable at 1¼ cents per pound and all others, including soluble or chemically treated starch, were dutiable at three-fourths of 1 cent per pound. The rates and classifications since 1883 are shown in the following table:

*Rates of duty.*

Act of—	Paragraph.	Tariff classification or description.	Rates of duty.
1883.....	19	Dextrine, burnt starch, gum substitute or British gum .....	1 cent per pound.
1890.....	324	Dextrine, burnt starch, gum substitute or British gum.....	1½ cents per pound.
1894.....	233	Do.....	Do.
1897.....	256	Do.....	2 cents per pound.
1909.....	297	Dextrine, dextrine substitutes, soluble starch or chemically treated starch, burnt starch, gum substitute or British gum.	1½ cents per pound.
1913.....	36	Gums: * * * dextrine, made from potato starch or potato flour. Dextrine, not otherwise provided for, burnt starch or British gum, dextrine substitutes, and soluble or chemically treated starch.	1¼ cents per pound. ¾ cent per pound.



## CUSTOMS DECISIONS.

Potato starch which has been chemically treated so that it is in part soluble in hot water and which is known as soluble starch, although a portion of it is insoluble in water, is dutiable under the provision in paragraph 36 for "soluble or chemically treated starch," and not under paragraph 234 as "starch made from potatoes." (G. A. 7633, T. D. 34906 of 1914.)

A starch product commercially known as white dextrine, which is technically neither starch nor dextrine, was held dutiable under paragraph 286 of the act of 1897 as "dextrine" and not under paragraph 285 as "starch." (*Morning star v. United States*, 159 Fed., 287 of 1907.)

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## APPENDIX.

(Issued August 13, 1915.)

UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF CHEMISTRY.

### SERVICE AND REGULATORY ANNOUNCEMENTS, NO. 14.

#### 130. USE OF THE TERMS "POTATO FLOUR," "RICE FLOUR," "CASSAVA FLOUR," AND "TAPIOCA FLOUR."

It has come to the attention of this bureau that such products as potato starch, rice starch, and cassava starch are often designated by the terms "potato flour," "rice flour," and "cassava flour" or "tapioca flour." In the opinion of this bureau the term "flour" when applied to potato or rice or cassava products has the same meaning as when applied to other products, that is, a finely divided or powdered product containing proteids, fat, fiber, and ash constituents from the edible portions of the potato, rice or cassava, and not such a product containing the starch alone.

### DECISIONS OF TREASURY DEPARTMENT, BOARD OF GENERAL APPRAISERS, AND COURT OF CUSTOMS APPEALS.

#### POTATO STARCH.

(T. D. 16955—G. A. 3383.)

Before the United States General Appraisers at New York, February 4, 1896.

In the matter of the protests, 25843b-11913 and 25959b-11932, of M. L. Barrett, against the decision of the collector of customs at Chicago, Ill., as to the rate and amount of duties chargeable on certain potato starch, imported per Venecia and Dania, and entered on December 13, 1894, and January 4, 1895, respectively.

Opinion by LUNT, General Appraiser.

We find—

(1) That Mr. M. L. Barrett imported into the port of Chicago, Ill., December 13, 1894, and January 4, 1895, certain merchandise from Germany invoiced as potato flour upon which duty was assessed at the rate of  $1\frac{1}{2}$  cents per pound under the provisions of paragraph 232, act of August 28, 1894, and which is claimed to be dutiable at 20 per cent ad valorem under section 3 of said act as a nonenumerated manufactured article.

(2) The said merchandise is potato starch, powdered, and known in the trade as potato flour. It is the same article that was passed upon in the case of *The Union National Bank of Chicago v. Seeberger* (30 Fed. Rep., 429).

Potato starch is very extensively manufactured in the United States and is sold upon the market in the form of granules of considerable size and also ground and bolted. In the latter condition it is called potato flour. Probably 90 per cent or more of this kind of starch is consumed in the manufacture and finishing of textile fabrics, it having a peculiar quality of penetrating fabrics and giving the requisite stiffness without showing upon the surface, while cornstarch and wheat starch are more particularly adapted to giving a surface finish to fabrics. In proportion to the entire quantity of starch produced only a small percentage is used for laundry purposes. Powdered potato starch, or potato flour, is used in considerable quantities by confectioners.

In the manufacture of potato starch in Germany, the starch, after having been separated from the potato pomace, is generally dried in centrifugal machines, and consequently all this product exported from Germany is in the form of potato flour, while in those factories in this country where centrifugals are not used the starch is generally put upon the market in the form of large granules and is afterwards powdered if so required.

The protests are overruled and the decision of the collector affirmed in each case.

## POTATO FLOUR.

(T. D. 34236.)

Potato flour obtained by reducing entire potatoes to the state of flour by desiccating and grinding, dutiable as a nonenumerated manufactured article at the rate of 15 per cent ad valorem, under paragraph 385, tariff act of 1913.

TREASURY DEPARTMENT, *March 5, 1914.*

SIR: I have to acknowledge receipt of your letter of the 21st ultimo, relative to the classification of potato flour obtained by reducing entire potatoes, sometimes with and sometimes without the skins, to the state of flour, by desiccating and grinding, the process involving the application of sufficient heat to materially modify the starch granules.

You cite the decision of the board, Abstract 23912 (T. D. 30901), wherein it was held that similar merchandise imported under the tariff act of 1909 was properly dutiable as a nonenumerated manufactured article under paragraph 480 of the said act, and was not dutiable as "vegetables, prepared."

The board, in the decision referred to by you, cited its previous decision, G. A. 5534 (T. D. 24904), wherein it was held that certain bean flour, which had been assessed with duty as a substance fit for use as starch, was properly dutiable as a nonenumerated manufactured article under section 6 of the act of 1897. In this decision the board cites its previous decision, G. A. 5361 (T. D. 24513), holding that the provision for prepared vegetables does not include an article in which the manufacturing process has advanced so far that the identity of the vegetable is practically lost.

Following the decisions cited, the department is of the opinion that the provision in paragraph 581 for potatoes, dried, desiccated, or otherwise prepared should be limited to potatoes which have not lost their identity as such. You are accordingly directed to assess duty upon potato flour of the character under consideration at the rate of 15 per cent ad valorem as a nonenumerated manufactured article under paragraph 385 of the tariff act.

Respectfully,  
(100269.)

CHARLES S. HAMLIN,  
*Assistant Secretary.*

COLLECTOR OF CUSTOMS, *New York.*

## DESICCATED POTATOES.

(6 Ct. Cust. Appls., 154, T. D. 35397.)

Stein, Hirsch & Co. et al. v. United States (No. 1503).

POTATO GROUND MEAL OR FLOUR.—This article is produced from potatoes only and contains the entire and chemically unaltered elements of which the constituent potatoes themselves were composed. It has not acquired a new name, use, or character, and serves such culinary purposes as potatoes themselves. It is potatoes, prepared, and falls within the provisions of paragraph 581, tariff act of 1913.

UNITED STATES COURT OF CUSTOMS APPEALS, MAY 3, 1915.

Appeal from Board of United States General Appraisers, Abstract 37090 (T. D. 35020).

(Reversed.)

Before Montgomery, Smith, Barber, De Vries, and Martin, Judges.

MARTIN, *Judge*, delivered the opinion of the court:

The present merchandise was imported under the tariff act of 1913. It was invoiced as "kartoffelwalzmehl," which is said by counsel to be a German word meaning "potato ground meal."

The appraiser reported that the article in question consisted of potato flour obtained by reducing entire potatoes, with or without the skin, to the state of flour by desiccating and grinding, the process involving the application of sufficient heat to materially modify the starch granules. The article was returned for duty as a nonenumerated manufactured article, at 15 per cent ad valorem, under paragraph 385, tariff act of 1913, in accordance with the department's instructions contained in T. D. 34236. Duty was assessed accordingly.

The importers protested against the assessment, claiming that the merchandise was entitled to free entry as desiccated or prepared potatoes under paragraph 581, act of 1913, or if dutiable at all that it was only dutiable at 10 per cent ad valorem under the retaliatory proviso of that paragraph. The protest also claimed a rebate of 5 per cent on any duties which should be assessed upon the merchandise by virtue of subsection 7 of paragraph J of section 4 of the tariff act of 1913. This latter claim, however, was not sustained by any proofs at the trial before the board, and therefore may be regarded as abandoned for the present case.

The protest was tried upon evidence before the Board of General Appraisers and was overruled, from which decision the importers now appeal.

The question therefore is whether the present merchandise is desiccated potatoes or potatoes otherwise prepared, governed by paragraph 581, tariff act of 1913, or is a nonenumerated manufactured article, governed by paragraph 385 of that act.

The following is a copy of the two competing paragraphs thus cited:

581. Potatoes, and potatoes dried, desiccated, or otherwise prepared, not specially provided for in this section: *Provided*, That any of the foregoing specified articles shall be subject to a duty of 10 per cent ad valorem when imported directly or indirectly from a country, dependency, or other subdivision of government which imposes a duty on such articles imported from the United States.

385. That there shall be levied, collected, and paid on the importation of all raw or unmanufactured articles not enumerated or provided for in this section a duty of 10 per cent ad valorem, and on all articles manufactured, in whole or in part, not provided for in this section, a duty of 15 per cent ad valorem.

The testimony discloses that the present article is produced from potatoes. The potatoes are cut into pieces about the size of ordinary potato chips, which are processed until they are thoroughly desiccated. These desiccated chips are used for culinary purposes in the place of potatoes. A certain part of this product, however, is ground into meal of several degrees of fineness, one kind resembling corn meal in appearance, the other being as fine as common wheat flour. The present merchandise belongs to the class last described and is especially useful for making bread, either alone or in combination with other materials. It is also useful for other culinary purposes, of which the making of soup may be named as an instance. The appraiser reports that the process above described has the effect of materially modifying the starch granules of the constituent potatoes. This statement seems to be contradicted by the testimony of the witness Goldfrank, but both the statement and the testimony are somewhat indefinite. The court, however, does not understand that any chemical change in the substance of the potatoes is effected by the drying and grinding processes to which they are subjected.

The three products above described, namely, the desiccated chips, the coarser meal, and the finely ground flour, are all subjects of importation into this country, but the fine flour is the form which is most frequently imported. The present question is whether that product is free of duty as potatoes "desiccated, or otherwise prepared," under paragraph 581, above copied. As is stated above, the appraiser in his official report named or described the article as "potato flour."

The record contains the testimony of two witnesses only. One of these testified that the present article is "desiccated potatoes"; the other witness stated that the article is "ground potato or potato flour." Neither statement is in the nature of commercial testimony tending to prove a peculiar trade usage of the statutory terms in question; those terms therefore must be accepted in this case according to their common or ordinary signification.

It therefore appears that the present article is produced from potatoes only, and that it contains the entire and chemically unaltered elements of which the constituent potatoes themselves were composed. It also appears that the article is used like potatoes for culinary purposes, and apparently possesses the same food values as potatoes. It is true that it is chiefly, and indeed almost exclusively, used for making bread, but it may also be used in making soup and other dishes. The fact that the article is used in making bread does not imply that it has ceased to be prepared potatoes, since bread is also made from potatoes which are not first desiccated like the present product. The following quotations relate to this subject.

#### Century Dictionary:

*Potato bread*.—A bread made of potatoes which have been boiled, pressed till they are dry, beaten up, kneaded with wheat flour, aniseed, and yeast, and then baked.

#### Standard Dictionary:

*Potato bread*.—A bread made of boiled sweet (sometimes white) potatoes mixed with wheat flour and yeast.

It therefore appears to be within common knowledge that potatoes are used in making bread and that this is done at times by first boiling the potatoes and then mashing them, so that they may be kneaded with wheat flour and baked into bread. The use of the present article in making bread does not differ essentially from the one

just above described as a commonly known use of potatoes. It may also be noted that wherever the present article is named or described in the record the term "potato" appears as part of its title. The article is therein called potato ground meal, potato flour, ground potato, or desiccated potatoes. The court therefore concludes that after all the present article has not acquired a new name, use, or character, but still retains the name and essential characteristics of potatoes, and serves such culinary purposes as potatoes themselves serve. The article differs from potatoes in their original form only because it is prepared for the uses to which potatoes as such are applied. It is, consequently, "potatoes, prepared," rather than a new manufacture from potatoes. *Vitelli & Son v. United States* (4 Ct. Cust. Appls., 75; T. D. 33313).

An additional consideration may be suggested in support of this conclusion. The tariff act of 1909 laid a duty of 40 per cent ad valorem upon "vegetables, prepared in any way" (par. 252), and also a duty of 25 cents per bushel upon "potatoes" (par. 263). There was no specific provision in the act for "potatoes, dried, desiccated, or otherwise prepared," such as now appears in the act of 1913.

When merchandise like the present article was imported under the tariff act of 1909, the Government assessed the same with duty at 40 per cent ad valorem as prepared vegetables under paragraph 252. The importers protested, claiming assessment of the merchandise as a nonenumerated manufactured article. The board sustained such protests, holding that the article was not a prepared vegetable under paragraph 252 of the act, but was an unenumerated manufactured article. The potato paragraph of the act of 1909 did not apply to the case at all, since it only included potatoes which were to be assessed by the bushel. The following board decisions under the act of 1909 severally held the present article to be dutiable as a nonenumerated manufactured article rather than a prepared vegetable: Abstract 23912 (T. D. 30901), Abstract 24033 (T. D. 30969), Abstract 24537 (T. D. 31207), Abstract 25573 (T. D. 31589), Abstract 24918 (T. D. 31335), Abstract 26347 (T. D. 31832), Abstract 26277 (T. D. 31813), Abstract 27204 (T. D. 32031), Abstract 27464 (T. D. 32126), Abstract 28784 (T. D. 32618), Abstract 28184 (T. D. 32424).

These decisions were all published prior to the tariff revision of 1913, and in each decision as published the merchandise itself was named or described by the board as "ground desiccated potatoes."

In the light of the foregoing decisions, holding that "ground desiccated potatoes" were unenumerated in the tariff act of 1909, Congress enacted paragraph 581 of the tariff revision of 1913, and provided therein for the free entry of "potatoes, and potatoes dried, desiccated, or otherwise prepared." The fact that "desiccated potatoes" were thus enumerated eo nomine in the act of 1913, following the foregoing decisions dealing with the present article under that name, tends strongly to the conclusion that this identical merchandise was within the contemplation of Congress at the enactment of the latter paragraph. This conclusion is strengthened by the appearance of the phrase "or otherwise prepared" in the same provision.

In this view of the case the decision of the board is reversed, and the case is remanded in order that the collector may assess the retaliatory duty of 10 per cent ad valorem provided for by paragraph 581, *supra*, in case it be found that the present merchandise is "imported directly or indirectly from a country, dependency, or other subdivision of government which imposes a duty on such articles imported from the United States."

It may be added that counsel have cited numerous decisions in support of their respective contentions. These have been examined, but need not now be discussed.

Reversed.













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